

## SOME MORE NOTES ON POLYPLACOPHORA. PART I.

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*Read 17th April, 1914.*

SOME time ago I contributed to these Proceedings some notes on Polyplacophora (vol. ix, pp. 90-105 and pp. 153-62, 1910), and in the last part (vol. xi, pp. 25-51, 1914) I furnished an account of the Chiton Fauna of the Kermadec Islands. During the intervening years I have accumulated some interesting notes, mostly on extra-Australian forms, and a larger number of notes, dealing with Australasian material, I hope to incorporate in a review of the Australasian Chiton Fauna I have in preparation. However, Dr. Thiele has written me that he is now preparing a monograph of the Polyplacophora for *Das Tierreich*, and I therefore consider it necessary that my notes should be made available so that they may be criticized in the production of Dr. Thiele's work. The succeeding notes are mainly nomenclatural, but are of more than usual interest, while some few are suggestive.

## CRASPEDOCHITON (THAUMASTOCHITON) MÖBIUSI, Thiele.

In the Report on the Marine Mollusca obtained by J. Stanley Gardiner among the Islands of the Indian Ocean (Trans. Linn. Soc. Lond., vol. xiii, p. 119, 1909) Melvill recorded—

“357. *Acanthocites (Loboplax) laqueatus* (Sowb.).

*Loc.* Amirantes: Station E 13, 20 to 25 fathoms, calcareous rubble.”

The specimen upon which this record is based is now in the British Museum, and at the first glance it seemed quite distinct from Sowerby's *laqueatus*. The shell is curled, and approximately measures 38 mm. × 15 mm. The girdle is produced in front and narrowed behind, and could be termed leathery, minutely sandy. Four pores are clearly observed before the head-valve, and seven at the sutures, and a peculiar feature is their presence behind the tail-valve. Here, apparently protected by the curling, the tufts are preserved, as is also a peripheral fringe, consisting in each case of long opaque-white spicules. The colour of the girdle is bright puce pink. The head-valve is sculptured with seven elevated ribs, the outside ones constituting the border. I note this, as in *Loboplax* usually only five ribs are indicated, no outside ones being developed. These ribs are not differentiated in any way, but appear simply as undulating elevations. The sculpture consists of rounded separated pustules of varied sizes. The lateral areas of the median valves are well raised, the sculpture consisting of rounded pustules closely packed; the median areas are covered with oval flat-topped pustules which become confused and merged into a continuous flattened rib on the jugum. The tail-valve is long, *the mucro posterior, very much elevated and recurved, then sloping backward, making a convex lateral area.* I have

seen no similar tail-valve yet in any other Chiton. The upward curve of the tail-valve of *Plaxiphora (Frembleya) egregia* (H. & A. Adams) is recalled, but this instance much exaggerates it. Besides, in that case there is no convex lateral area, which is clearly shown in this. Upon dissection the tail-valve was found to possess, instead of an insertion-plate, simply a callused ridge showing faint striations. In his Revision des Systems der Chitonien (Chun's Zoologica, Heft lvi), Thiele (p. 34) introduced for a Mauritius shell *Craspedochiton (Thaumastochiton, n.subgen.) möbiusi*, n.sp.

Beautiful figures are given on Taf. iv, figs. 36-48, and the Amirantes shell certainly falls into the sub-genus *Thaumastochiton*, though it may specifically differ from Thiele's Mauritian form. The tail-valve in the latter, judging from Thiele's figures, does not show such an upcurved mucro, nor possess such a well-defined, convex, lateral area.

As the Amirantes would geographically fall into the Mauritius area, and further, as only one specimen is available, I would minimize the observed differences and record this shell under Thiele's species-name. On account of the interest this sub-generic form must have to all Chiton students, I have brought forward this alteration, and would note the rejection of *laqueatus*, Sow., from the Amirantes fauna. Thiele (p. 116) under *Thaumastochiton* made a footnote "Dahin gehört wahrscheinlich 'Onithochiton' *isipingoensis*, Sykes (P. Malac. Soc. London, vol. iv, p. 259) von Sud-Afrika". This induced the examination of Sykes' species, the type of which is preserved in the British Museum. It was obviously no *Onithochiton*, judging from the description alone, and was as certainly a *Craspedochitonoid* shell. Thiele's suggestion proved correct, since, though '*O.*' *isipingoensis*, Sykes, differed altogether in sculpture from the Amirantes shell, the tail-valve agreed minutely in structural characters. Sykes' description of the tail-valve is here reproduced: "Posterior valve similarly sculptured, but having a dorsal area; it is concave above and the mucro is posterior. . . . The insertion plate of the posterior valve is flattened behind, and appears to be without any slit, the tegmentum overhanging, and the valve being obtusely beaked behind."

#### CHITON PETASUS, Reeve.

This species is described in the Proc. Zool. Soc., 1847, p. 25, and figured in the Conch. Icon. *Chiton*, and also in the Zoology of the *Samarang*. In the Man. Conch., vol. xiv, p. 311, Pilsbry placed this species in the genus *Placiphorella*, with the note "Referred to this genus on account of the peculiar girdle". At that time the genus *Craspedochiton* was imperfectly known, and consequently it was a forgivable error to overlook the undoubted relationship of Reeve's species to that genus. However, quite recently Nierstrasz, determining the Chitons of the Siboga Expedition (p. 43, 1905), has introduced a new species of *Craspedochiton* with the name *tesselatus*, which, coming from the same locality, seems to be the long-lost Reevean species. It should be observed that in the same paper

(p. 111) Nierstrasz catalogued *Placiphorella petasa*, Reeve, as being on record, from the locality, with the remark "*Placiphorella petasa*, Reeve, von Stroomen Kap, N. W. Celebes stellt ebenso eine isolierte Form dar". The recognition of *Chiton petasus*, Reeve, as referable to *Craspedochiton*, and not to *Placiphorella*, removes one of the few apparent geographical anomalies present when the distribution of the Polyplacophora is studied.

In this place I might point out that Nierstrasz (p. 23) introduced a new species of *Ischnochiton* with the species-name *variegatus*. I cannot see that amendment has yet been made, though one of the commonest Australian *Ischnochitons* bears that species-name, and has the prior right. Reverting to geographical anomalies, I would cite a paper by Nierstrasz in the Tijdschr. der Nederl. Dierk. Vereen, ser. II, vol. x. In that paper Nierstrasz, through the acceptance of inaccurate Museum records, has perpetuated some incorrect generic determinations, and introduced others. These will mostly be dealt with in their places, but the admission of *Cryptoplax* to the Neozelanic Fauna, the reference to *Maugeria* of specimens from the Straits of Magellan and the Cape of Good Hope, as also *Tonicia* from New Zealand, will be refused without the slightest hesitation until perfectly authenticated examples are procured.

Nierstrasz also referred to *Heterozona* the species Hedley described (Proc. Linn. Soc. N.S.W., vol. xxiii, p. 100, 1898) under the name *Ischnochiton araucarianus*.

Thiele (Revision, p. 96) suggested the reference of this species to *Sclerochiton*. Judging from figures I agreed, and it seemed difficult to separate this from *Chiton (Sclerochiton) miles*, Pilsbry, described from Torres Straits. With his usual generosity, Mr. Hedley forwarded me paratypes of his species, and without doubt it is very close to *S. miles*. I have received a fair collection of *Chitons* made by my friend Mr. Robin Kemp at Cape York, Torres Straits, and therein was included many specimens of *S. curtisianus* (Smith), proving that that species extends from Port Curtis northwards to Cape York, thus apparently confirming my subjection of Thiele's *S. aruensis* (Proc. Malac. Soc., vol. ix, p. 103, 1910). Nothing like Pilsbry's *S. miles* has yet been seen from Torres Straits, so that it is quite possible the locality is erroneous, and that the shell may have come from New Caledonia. I hope to revert to this matter again soon.

Two other incorrect determinations may be here rectified. In the Report on the Polyplacophora of Ceylon (Ceylon Pearl Oyster Fisheries Suppl. Reports, p. 178, 1903) Sykes recorded *Callochiton platessa*, Gould? This would seem to be confirmed by the admission by Smith into the Fauna of the Maldives and Laccadives, p. 619, of the same species, *C. platessa*.

This species is fairly familiar to me, as I have collected it both in New Zealand and Australia, and though both Smith's and Sykes' shells, which I have examined, are undoubtedly referable to the genus *Callochiton (sensu lato)*, they are just as certainly not specifically identical with Gould's *C. platessa*.

## CHÆTOPLEURA NOBILIS, Pilsbry.

In the *Man. Conch.*, vol. xiv, p. 30, 1892, Pilsbry included a species *Chætopleura nobilis*, citing it as of Reeve, basing it upon "*Chiton nobilis*, Gray, Reeve, *Conch. Icon.*, pl. xxi, fig. 139, May, 1847. Not *Chiton nobilis*, Gray; *Chætopleura nobilis*, Rv., Cpr. MS." Reeve's figure is reproduced on Pilsbry's pl. xiv, fig. 80.

The species is included upon Carpenter's MS. notes which Pilsbry quotes. Some extraordinary confusion has here occurred, as part of the note reads: "The above is written from the type specimen which Rve. described as the *C. nobilis* of Gray, and which Mr. Adams most kindly submitted to my examination." I have been unable to fathom the connexion of Mr. Adams with the type-specimen, as Reeve described his *Ch. nobilis*, Gray, from a specimen in the British Museum, which is still preserved with the data upon the back of the tablet. This shell is undoubtedly the New Zealand *Eudoxochiton nobilis* (Gray), so that we are confronted with the problem of Adams' shell. As its whereabouts are unknown, it would seem necessary to write off, as indeterminable, the species *Ch. nobilis*, Pilsbry. The Reevean reference and figure pass correctly into the synonymy of the New Zealand shell, whilst the citation of Pilsbry's name in connexion with the missing *Chætopleura* keeps the latter in perspective, so that its rediscovery may be looked for. The unknown locality, of course, handicaps the investigator.

## The genus-name ACANTHOCHITONA.

In the London Medical Repository, vol. xv, 1821, John Edward Gray published "A Natural Arrangement of Mollusca, according to their internal structure". Dealing with the genus-name *Chiton*, Pilsbry (*Man. Conch.*, vol. xiv, p. 150, 1893) quoted the matter dealing with Chitons, but did not dispose of the questions offered by that excerpt. Inasmuch as Pilsbry incorrectly quoted that extract, it is possible he was indebted to second-hand information for his knowledge of the paper.

If the concluding paragraph of Gray's article (p. 239) be studied, the procedure is quite simple. This reads: "The genera that are here given mostly contain many sub-genera, and are what are called by several modern naturalists natural families; but I prefer to call them genera, and their subdivisions sub-genera, because then either name can be used separately, and so suits both opinions, for the genera may be made into families by changing the termination as from limax to limacidae, and because I think that it is easier to recollect limax arion hortensis than arion hortensis alone, as genera are now become so numerous that naturalists really want something to let them know to what part of natural history they belong." With this in front of us we know how to deal with the following nomination on p. 234—

"Ord. 10. POLYPLACOPHORA.

(Description of animal, etc.)

a. Plates placed on the back of the mantle.

1. Gymnoplax or gymnoplacidae. Acanthochitona, Chiton fascicularis, Lepidochitona, Chiton marginatus."

When Pilsbry quoted this extract he wrote *Leptochitona*, which is quite a different name. There can be no other conclusion than that the name *Acanthochitona* is correctly introduced as a sub-generic name for the species grouped with *Chiton fascicularis*. Though never hitherto used, it claims every right to usage, and fortunately little confusion will be caused by giving the name its due. The name commonly in use is *Acanthochites*, which date from Risso, 1826. Risso introduced it from Leach's MS., and it is probable that Gray was also influenced by Leach's proposition. It might be noted that Risso's spelling has been amended to *Acanthochates*, *Acanthochitus*, and even *Acanthochiton*, whilst the species are commonly called *Acanthochitons* as a vernacular term.

Though not recorded in Scudder's Nomenclator, Gray's genus-name appears in the synonymy of *Acanthochites*, Risso, in H. & A. Adams' Genera Recent Mollusca, vol. i, p. 482.

#### The genus-name LEPIDOCHITONA.

The consideration of this name naturally follows the preceding discussion. However, here rather radical alterations are necessary. The only species mentioned in conjunction with the name is *Chiton marginatus*, and this consequently becomes the type by monotypy. Pilsbry (Man. Conch., vol. xiv, p. 67, 1892) included this species in the genus *Ischnochiton*, placing it in the sub-genus *Trachydermon*, Carpenter, 1863, citing as a synonym *Craspedochilus*, G. O. Sars, 1878. The succeeding year, however, Pilsbry (Man. Conch., vol. xv, p. 63, 1893) admitted that *Trachydermon* was generically distinct from *Ischnochiton*, and named as type *T. flectens*, Carpenter. *Craspedochilus*, G. O. Sars, was proposed for *C. marginatus* alone, and in the List of British Marine Mollusca, prepared by a Committee of the Conchological Society (Journ. Conch., vol. x, p. 10, 1901), *Craspedochilus*, probably at Sykes' suggestion, was given generic rank, as independent of *Trachydermon*. *Lepidochitona* will therefore displace *Craspedochilus*, being exactly equivalent to it.

Thiele (Revision, p. 116, 1909) makes *Trachydermon* a genus of his family Callochitonidæ, ranking *Craspedochilus* as subordinate, with sectional rank; his family Callochitonidæ is divided into two sub-families, *Trachydermoninæ* and *Callochitoninæ*. The acceptance of Thiele's classification and the recognition of *Lepidochitona* would necessitate the following alterations:—

Family LEPIDOCHITONIDÆ.

vice CALLOCHITONIDÆ.

Sub-family LEPIDOCHITONINÆ.

vice TRACHYDERMONINÆ.

Genus *Lepidochitona*, Gray, 1821 (= *Craspedochilus*, G. O. Sars, 1878).

vice *Trachydermon*, Cpr., 1863.

Sub-genus *Trachydermon*, Cpr., 1863.

In the Proc. Zool. Soc. Lond., 1847, p. 127, Gray introduced the new genus *Leptochiton* with three species, *cinereus*, *hanleyi*, and

*cajetanus*. The first-named was designated, as type, on p. 169. This cannot be considered the same name as *Lepidochitona*, the two roots having entirely different meanings. *The group by the type species will be an exact synonym of Lepidochitona.*

The genus-name *AMICULA*.

Pilsbry in the *Man. Conch.*, vol. xv, p. 63, 1893, gives, as the primary introduction of this genus-name, Gray, *Proc. Zool. Soc. Lond.*, 1847, pp. 66, 69, 169, and notes the *Syn. Brit. Mus.*, 1840, usage as earlier, but without diagnosis. In the *Proc. Malac. Soc. Lond.*, vol. x, pp. 294-309, 1913, I gave the results of my investigation of the Synopses British Museum. There I showed that in 1840, on p. 148, appeared the new generic name *Amicula*. On p. 302 I showed that in the 1840 A edition, p. 127, the following note was given: "*Acanthochetes* is peculiar for having a bundle of bristles placed on each side of the valves; and *Chitonellus* and *Amicula* only differ in having the valves nearly hidden in the mantle of the animals." I would agree with Pilsbry that there can be no determination about a name introduced in this manner.

In Dieffenbach's *Travels in New Zealand*, vol. ii, p. 246, 1843, Gray included as a New Zealand shell "*Amicula monticularis*. *Chiton monticularis*, Quoy et Gaim., *Voy. Astrol.*, iii, 406, t. 73, f. 30-36". This is the first time *Amicula* is generically used as a recognizable group, and consequently that name falls as a synonym of *Cryptoconchus*.\* *Cryptoconchus* is rejected by Pilsbry as of Burrow, 1815, and dated from Guilding, 1829.

In the *Elements of Conchology*, 1815, Burrow described a shell under the name *Chiton porosus* (p. 189), and figured it, pl. xxviii, fig. 1, giving "Habitat uncertain, probably New South Wales". On p. 190 he wrote: "They (this and the succeeding species) have been examined by Dr. Blainville, of Paris, by whom a communication respecting them has, it is understood, been made to the French Philomatic Society. The names he has affixed to the two species are *Cryptococonchus porosus* and *C. larvaformis*." According to the Opinions rendered by the International Commission on Zoological Nomenclature, *Cryptoconchus* must be recognized as from this introduction. If it were not it might be argued that it should fall as a substitute name for *Cryptoplax*, Blainville. This genus-name introduced in the *Dict. Sci. Nat.* (Levrault), vol. xii, p. 124, 1818, contained the same two species, but both genus-name and one species-name were changed; thus *Cryptoplax larvaformis*, Blainville = *Cryptoconchus larvaformis*, Burrow, ex Blainville MS., and *Cryptoplax depressus*, Blainville = *Cryptoconchus porosus*, Burrow, ex Blainville MS. Blainville states that *Cryptoplax* was "Sous-genre de l'ordre des oscabrions, établi par M. H. de Blainville, dans le Supplément à l'Encyclopédie d'Edinbourg". It would appear that Blainville's articles concerning these molluscs were too advanced to meet with approval by the powers that were concerned in the publication, as neither in the *Bulletin of the French Philomatic Society* nor in the Supplement to the *Encyclopædia Britannica* are they included.

*The northern shells which have been called Amicula will take the name of Asymmetroglyphus (Midd) Chemn. 1859 - type C. pallasii Midd.*

Moreover, it would seem that Blainville himself got disgusted at the treatment of his genus, as in his monumental monograph on the Chitons in the Dict. Sci. Nat. (Levrault), vol. xxxvi, p. 519 et seq., 1825, he discarded it, and included the species in the genus *Chiton*, but once again changing their names. Here, on p. 553, *Chiton vermiformis*, Blainville = *Cryptoplax larviformis* of seven years earlier, and *Chiton leachi*, Blainville = *Cryptoplax depressus* of seven years previous. Pilsbry preferred *Acanthochites*, Risso, 1826, to *Cryptoconchus*, Guilding, 1829, and based his family name on that, separating the *Cryptoplax* species into a separate family, Cryptoplacidae. Thiele has amalgamated these two families, ranking them as sub-families only, and using the name Cryptoplacidae on account of the earlier introduction of the genus-name *Cryptoplax*.

The conclusion that *Cryptoconchus* must date from 1815 makes this the oldest genus-name, and consequently the family name would become Cryptoconchidae. I am at present inclined to agree with Thiele that *Cryptoplax* is not able to be considered as separable as a family.

#### The genus-name MACANDRELLUS.

This name was introduced ex Carpenter's MS. by Dall in the Proc. U.S. Nat. Mus., vol. i, p. 299, 1878, where the type is designated as *Macandrellus costatus*, Adams & Angas. Pilsbry rejected it in the Man. Conch., vol. xv, p. 32, 1893, as Dall's genus was not the same as that of Carpenter, and also "The first use of the name (as above) being unaccompanied by a diagnosis must fall". In my investigations I constantly meet with such statements by authors, and Dall wrote (Journ. Conch., vol. xi, p. 294, 1906), "It is an unfortunate fact that the abrogation of the original rule requiring a diagnosis to validate a genus." I will admit there may have been such a rule, but the abrogation appears to have been useful as long ago as 1847, and probably earlier. For we have Gray in the Proc. Zool. Soc., 1847, when he drew up his epoch-marking "List of the Genera of Recent Mollusca, their Synonyma and Types", introducing new generic names without a diagnosis. We have the commonly utilized Catal. Yoldi Collection, 1853, by Mörch, and I note Fischer in his Man. Conch. in 1880-7 also indulging in the same practice; this is only to quote the very first works that occur to memory. Judging from Risso's genera, where the generic diagnosis disagrees with the identifications of the species named, it would have been better had the abrogation commenced earlier.

To come back to *Macandrellus*, there is now no lawful reason for its non-acceptance, and it must replace the name *Loboplax*, Pilsbry, introduced in the *Nautilus*, vol. vii, p. 32, 1893, with *Chiton violaceus*, Quoy & Gaimard, cited as type. This species and Adams and Angas' *costatus* are undoubtedly congeneric in the strictest restriction.

In my paper in these Proceedings (vol. ix, p. 101, 1910) I noted the extreme difficulty of determining the divisions of *Acanthochites*. I showed Thiele had been puzzled, and admitted my own difficulties. I, from further study, now consider the admission of the following

generic terms will be more helpful in discriminating these difficult shells when dealing with the Australasian forms: *Acanthochitona*, *Cryptoconchus*, *Cryptoplax*, *Notoplax*, *Macandrellus*, and *Craspedochiton*.

The Neozelanic shell commonly known as *Acanthochites violaceus* (Quoy & Gaimard) would become *Macandrellus violaceus* (Quoy and Gaimard), and the second Neozelanic species *M. mariæ* (Webster). *Craspedochiton* would also be credited with two New Zealand forms, *C. rubiginosus* (Hutton) and *C. cuneatus* (Suter). It is a somewhat remarkable coincidence that both these species, at an interval of almost forty years, should have been described as *Tonicia*, a genus without the slightest resemblance in any way to these species. It is exactly parallel with Sykes' reference of a similar shell to *Onithochiton*, as previously noted.

Although the genus *Tonicia* is unknown from New Zealand, I have recorded the existence of a small species of *Lucilina* (= *Tonicia*) at the Kermadecs.

#### SOME MISUSED SPECIFIC NAMES.

I pointed out in my last paper (these Proceedings, p. 46) that Pilsbry, in his monograph (Man. Conch., vols. xiv-xv, 1892-3), did not accept the present usage regarding preoccupied names, and that consequently some alterations were necessary. To those interested I would suggest the following I have noted:—

On pp. 196-8, vol. xiv, Pilsbry admitted *Tonicia elegans*, based upon *Chiton elegans*, Fremby, Zool. Journ., vol. iii, p. 203, 1827; as sub-species were included *chilensis*, Fremby, *ibid.*, and *lineolata*, Fremby, *ibid.* *Ch. elegans*, Fremby, is unavailable on account of the prior *Ch. elegans*, Blainville, 1825, whilst *lineolata*, Fremby, is also later than Blainville's *lineolata*, 1825. This would leave the species-name as *chilensis*, Fremby, 1827, if Pilsbry's association be correct.

On p. 280 *Nuttallina scabra*, based upon *Ch. scaber*, Reeve, Conch. Icon., pl. xvii, fig. 106, Meh., 1847, must be changed, as Blainville had appropriated that specific name in 1825. There appears to be a substitute ready in *Acanthopleura fluxa*, Carpenter. On p. 283 a Mediterranean shell is called *Nuttallina cinerea*, Poli, though Poli's species is admitted to be both a mixture and also a misinterpretation of Linné's *Ch. cinereus*. There can be no reason urged against the rejection of Poli's specific name, but, as Pilsbry pointed out, some authorities have selected *caprearum*, Scacchi, 1836, and another *crenulatus*, Risso, 1826. Pilsbry regarded both these as indeterminate, and indicated *corrugatus*, Reeve, as the earliest certain name.

In these Proceedings (vol. ix, p. 91, 1910) I showed that *Ch. sulcatus*, Quoy & Gaimard, from examination of the type, was the shell commonly known as *Ischnochiton decussatus*, Reeve, and, as it had priority, advocated its use. In this case also Quoy and Gaimard's name is invalid through the prior *Ch. sulcatus*, Wood, 1811. I must apologize to my Australian friends who have freely adopted my nomenclature for thus misleading them, as it is now necessary to revert to the familiar Reevean *decussatus*.



A North Queensland shell needs a new name, for *Ch. pictus*, Reeve, Conch. Icon., pl. xv, fig. 79, 1847, from Raine's Island, Torres Straits, is invalid through the prior *Ch. pictus*, Blainville, 1825. The types of Reeve's species are in the British Museum, but it appears to be a somewhat rare shell. I propose for this species the new name

LUCILINA SHIRLEYI, NOM. NOV.

It is named after Dr. John Shirley to mark my thanks for his generosity in forwarding me his collection of Chitons for examination.

Whilst checking these notes I find that in the Manual, vol. xiv, p. 195, *Tonicia crenulata* is included, based upon *Ch. crenulatus*, Broderip, Proc. Zool. Soc., 1832, p. 27. But, as above noted, there is a prior *Ch. crenulatus*, Risso, 1826. A good substitute is ready in ? *Tonicia forbesii*, Carpenter, Mazatlan Cat., p. 193, 1856.